

Syo KUROKAWA*: **A note on *Parmelia omphalodes*
and its related species****

黒川 遼*: *Parmelia omphalodes* およびその近縁種について**

Parmelia omphalodes is a foliose lichen known quite well in Europe. It appears to have been commonly recognized by recent European lichenologists (Gams 1967, Poelt 1969, Duncan 1970) that the species is clearly distinguished from the related species such as *P. saxatilis* (L.) Ach. and *P. sulcata* Tayl. by the lack of isidia and soredia. However, Poelt (1969) recognized var. *discordans* (Nyl.) Magn. under *P. omphalodes*. In addition, the name *P. omphalodes* var. *panniformis* Ach. was used by some lichenologists, for instance by Norrlin & Nylander (1875) and by Vězda (1960). These two varieties form neither isidia nor soredia as in *P. omphalodes*. In the course of my studies on the genus *Parmelia*, I had a chance to examine specimens of these three taxa preserved mainly in the herbarium of the National Science Museum (TNS). The results of my morphological and chemical studies indicate that each of them can be better treated as a distinct species.

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1. ***Parmelia omphalodes*** (L.) Ach., Meth. Lich. 204. 1803.

Lichen omphalodes L., Sp. Pl. 1143. 1753. Type collection: Europe (not seen).

The present species resembles *P. saxatilis* (L.) Ach. in having laminal and marginal linear pseudocyphellae on the upper surface of lobes and simple and furcate rhizines. However, it is clearly separated from the latter species by the lack of isidia. It is also related to *P. sulcata* Tayl. *P. omphalodes*, however, lacks soredia and has simple and furcate rhizines, whereas *P. sulcata* is sorediate and has squarrosely branched rhizines. While the

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thalli of *P. saxatilis* and *P. sulcata* are usually grey, the color of the thalli of *P. omphalodes* are very variable, being grey, dark brown, blackish brown, or nearly black.

As chemical substances of *P. omphalodes*, atranorin, salacinic acid and lobaric acid were demonstrated in all specimens examined with the crystal and the thin layer chromatographic methods. Even though lobaric acid seems to be an accessory component in *P. saxatilis*, therefore, it seems to be a constant chemical component in *P. omphalodes*.

Exsiccatae examined. Krypt. Exs. ed. Mus. Nat. Hist. Natur. Vin-dobonensi, no. 2361. Norrlin & Nylander: Herb. Lich. Fenn., no. 206 (sub *P. omphalodes* f. *subimbricata*). Savicz: Lichenoth. Ross., no. 92. Vězda: Lich. Sel. Exs. no. 23 (sub *P. omphalodes* v. *panniformis*).

Specimens examined. Finland: Regio aböensis, Nauvo, east shore of Pensar Island, R. Alava s. n. Sweden: Vaddö parish, Nothamn, Uppland, I. Nordin s. n.; Herjunga, Vestergätland, C. Stenholm s. n. Faeroe Islands: Hvítanes, Streymoy, K. Hansen 130. Scotland: Argyllshire, Iona, P. James s. n. England: Holyhead Island, Wales, W. L. & C. F. Culberson 11540; Near St. Ives, Corn wall, W. L. & C. F. Culberson 11738. Germany: Schramberg, Baden, Vayhinger s. n. Switzerland: St. Moritz, Hepp 864. France: Elsass, Lösch s. n.: Süd Frankreich, Gogst s. n.

2. *Parmelia pinnatifida* Kurok., nom. nov.

Parmelia omphalodes β *panniformis* Ach., Meth. Lich. 204. 1803. Type collection: Helvetia, Schleicher ? 257 (H- Herb. Acharius, not seen).

Zahlbruckner (1930) erroneously credited Röhling (1813) with having made the combination *P. panniformis* (Ach.) Röhling for the present species. As pointed out by Esslinger & Ahti (1973) in the discussion on typification of *P. pulla*, however, "*P. panniformis*" was used only as an infraspecific binomial by Röhling. On the other hand, the specific epithet *panniformis* is preempted by a species of brown *Parmelia*, *P. panniformis* (Nyl.) Vain. (in Meddel. Soc. Fauna Fl. Fenn. 6: 124. 1881), which is based on *P. proluxa* f. *panniformis* Nyl. (Syn. Lich. Meth. 397. 1860).

Parmelia pinnatifida resembles *P. omphalodes* in having linear pseudo-cyphellae and simple and furcate rhizines. It has been considered to be easily distinguished from the latter species by the repeatedly branched lobes, which form imbricate and subascending narrow lobules 0.1-0.3 mm wide. However,



Fig. 1. Lobes of *Parmelia omphalodes* (left) and *P. pinnatifida* (right), showing distribution of pseudocyphellae on the upper surface ($\times 2.5$).

it can not be safely identified only by the presence of narrow lobules, because *P. omphalodes* also sometimes form similar lobules. Morphologically it can be more safely identified by the pseudocyphellae on the upper surface of lobes. In *P. pinnatifida* pseudocyphellae are mostly marginal, whereas they are laminal as well as marginal in *P. omphalodes* (Fig. 1). As mentioned above, atranorin, salacinic acid, and lobaric acid seem to be constant chemical components of *P. omphalodes*. In contrast, atranorin, salacinic acid, and fatty acids were demonstrated in all specimens of *P. pinnatifida*. These substances were also demonstrated in fragments of the type collection of *P. omphalodes* β *panniformis*, which Dr. T. Ahti kindly sent to me for my crystal tests. The results of thin layer chromatographic tests show that the fatty acids are identical with those of *P. expallida* Kurok. and *P. grayana* Hue (Kurokawa 1968). The fatty acids yield two spots on the chromatograms, at Rf 0.41 and Rf 0.52, though the Rf values were reported as 0.51 and 0.58 respectively in the previous paper.

Exsiccatae examined. Magnusson: Lich. Sel. Scand. Exs., no. 308 (sub *P. omphalodes* v. *cinereoalbida*). Norrlin & Nylander: Herb. Lich. Fenn., no. 24 (sub *P. omphalodes* v. *panniformis*). Pišút: Lich. Slov. Exs., no. 119 (sub *P. omphalodes*). Räsänen: Lich. Fenn. Exs., no. 706 (sub *P. omphalodes* v. *panniformis* f. *brunnea*).

Specimens examined. Sweden: Vestelgötland, C. Stenholm s. n. Germany: Strasse nach Todtnau, Baden, Lösch 58; Zastler, Baden, Lösch s. n.; Belchen,

Baden, Lösch s. n.; Berneck, Schramberg, E. Vayhinger s. n.; Berneckthal, E. Vayhinger ? s. n. Switzerland: St. Maria, Hepp s. n.

3. *Parmelia discordans* Nyl. in Brenn., Meddel. Soc. Fauna Fl. Fenn. 13: 40. 1886. Type collection (not seen).

Parmelia omphalodes var. *discordans* (Nyl.) Magn., Fl. Skand. busk- och bladlavar 89. 1929.

The present species resembles *P. omphalodes* in having brownish to blackish brown thalli, marginal and laminal pseudocyphellae, and simple and furcate rhizines. However, it is clearly distinguished from the latter species by the production of protocetraric acid rather than salacinic acid, though atranorin and lobaric acid seem to be components common between these two species. On the other hand, *P. discordans* is also related to *P. pinnatifida*. However, lobes of *P. discordans* are usually 1-2.5 mm wide, while those of *P. pinnatifida* form narrow lobules as mentioned above. *P. discordans* is also clearly separated from *P. pinnatifida* by the production of protocetraric and lobaric acids, though it sometimes produces fatty acids.

Exsiccatae examined. Krypt. Exs. ed. Mus. Nat. Hist. Natur. Vindobonensi, no. 2571 (sub *P. omphalodes* f. *insensitiva*).

Specimen examined. Sweden: Dreukén, Södermanland, O. G. Blomberg.

Literature cited

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日本産のカラクサゴケ (*Parmelia squarrosa*) 群の分類に着手する前に、ヨーロッパ産のこの群の各種の特性を明らかにしておく必要を感じて検討してみたところ、*P. omphalodes* 群に未解決の問題があることに気付いた。すなわち裂芽、粉芽を形成しない *P. omphalodes* 群の地衣は、形態的特性および化学的特徴によって 3 種 (*P. omphalodes*, *P. pinnatifida*, *P. discordans*) にわけて考える方が適当と思われる。